

1 We claim:

2 1. A forensic light source, comprising:

3 (a) a source of light outputting light having a plurality of wavelengths;

4 (b) a flexible light guide, having an input end and an output end, said flexible light  
5 guide receiving light from said source at said input end of said flexible light guide  
6 and transmitting said light to said output end;

7 (c) a filter for receiving light output by said output end of said flexible light guide  
8 and providing a filtered light output, said filtered light output having a wavelength  
9 characteristic different from the wavelength characteristic of light received by said  
10 filter;

11 (d) a mounting for supporting said filter at selectable angular position of said filter  
12 relative to said output end of said light guide to receive light from said output end  
13 of said light guide and to vary, in response to said relative angular position, the  
14 wavelength of light output by said filter;

15 (e) a mixing member having a mixing member input face with a plurality of mixing  
16 member input face regions and a mixing member output face with a plurality of  
17 mixing member output face regions, said mixing member positioned to receive the  
18 output of said filter, and said mixing member defining multiple paths for light  
19 between the mixing member input face and a mixing member output face which are  
20 configured to disperse light from one mixing member input face region to a  
21 plurality of mixing member output face regions.

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23 2. A forensic light source as in Claim 1, wherein said flexible light guide is a liquid  
24 light guide-liquid.

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26 3. A forensic light source as in Claim 2, wherein said liquid light guide is less than  
27 one meter in length.

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- 1    4. A forensic light source as in Claim 1, wherein said filter for receiving light output  
2    by said output end of said flexible light guide is an interference filter.  
3
- 4    5. A forensic light source as in Claim 1, wherein said filter for receiving light output  
5    by said output end of said flexible light guide is a selected one of a plurality of filters  
6    carried on a rotatable filter-supporting wheel.  
7
- 8    6. A forensic light source as in Claim 5, wherein said filter wheel is contained within  
9    a support chassis, and said filter wheel tilts within said support chassis.  
10
- 11   7. A forensic light source as in Claim 5, wherein said output end of said flexible  
12   light guide tilts with respect to said filter wheel.  
13
- 14   8. A forensic light source as in Claim 1, wherein said mixing member is removable.  
15
- 16   9. A forensic light source as in Claim 1, wherein said mixing member is a solid  
17   transparent member.  
18
- 19   10. A forensic light source as in Claim 1, wherein said mixing member generally  
20   rectangular in cross-section.  
21
- 22   11. A forensic light source as in Claim 1, wherein said mixing member has a length  
23   to width ratio between 5 to 1 and 10 to 1.  
24
- 25   12. A forensic light source as in Claim 1, wherein said mixing member comprises a  
26   randomized fiber-optic bundle.  
27
- 28   13. A forensic light source as in Claim 1, wherein said mixing member comprises a

1 compartment filled with a large number of light transparent members.

2  
3 14. A forensic light source as in Claim 1, wherein said filter for receiving light  
4 output by said output end of said flexible light guide is a selected one of a plurality  
5 of filters carried on a rotatable filter-supporting wheel, said filter supporting wheel  
6 being mounted on a post, said post being supported for tilting on a tilting support.

7  
8 15. A forensic light source, comprising:

9 (a) a source of light having a plurality of wavelengths;

10 (b) a flexible light guide, having an input end and an output end, said flexible light  
11 guide receiving light from the source at said input end and transmitting said light to  
12 said output end;

13 (c) a filter for receiving light output by said output end of said flexible light guide;

14 (d) a mounting for supporting said filter and said output end of said flexible light  
15 guide with a desired adjustable angular orientation with respect to each other at a  
16 position where said filter receives light from said output end of said light guide and  
17 allows a user to tilt the position of said filter relative to said output end of said light  
18 guide to vary the wavelength of light output by said filter, said filter producing a  
19 plurality of wavelengths at its output face when it is tilted at certain angles;

20 (e) an equalizing member having an optical characteristic equalizing the wavelength  
21 output of said filter across the face of said filter.

22  
23 16. A forensic light source as in Claim 15, wherein said equalizing member  
24 comprises a second filter.

25  
26 17. A forensic light source, comprising:

27 (a) a housing;

28 (b) a source of light outputting light at a plurality of wavelengths;

(c) a first filter , contained within said housing and receiving light output by said source of light along a path of propagation extending through said filter and providing a filtered light output, said filtered light output having an output wavelength characteristic different from the wavelength characteristic of light received by said filter, said output wavelength characteristic varying in response to the angular orientation of said filter relative to said path of propagation;

(d) a first mounting for supporting said filter at a selectable angular orientation of said filter relative to the path of propagation to vary said output wavelength characteristic, in response to said selectable angular orientation;

(e) a mixing member having a mixing member input face, said mixing member input face having a plurality of mixing member input face regions, and a mixing member output face, said mixing member output face having a plurality of mixing member output face regions, said mixing member positioned to receive the output of said filter, and said mixing member defining multiple paths for light between the mixing member input face regions and the mixing member output face regions, said paths being configured to disperse light from one mixing member input face region to a plurality of mixing member output face regions.

18. A forensic light source as in Claim 17, further comprising a flexible light guide wherein said mixing member is removably mounted relative to said housing and may be removed to receive said flexible light guide.

19. A forensic light source as in Claim 18, wherein said mixing member is less than forty centimeters in length.

1 20. A forensic light source as in Claim 17, wherein said filter for receiving light  
2 output by said output end of said flexible light guide is an interference filter.  
3

4 21. A forensic light source as in Claim 17, wherein said mounting for supporting  
5 said filter comprises a filter-supporting wheel, and further comprising a plurality of  
6 additional filters mounted on said filter-supporting wheel, said filter-supporting  
7 wheel being rotatably mounted on said housing.  
8

9 22. A forensic light source as in Claim 21, wherein said filter wheel is contained  
10 within said housing and said filter wheel is mounted for rotation on a bracket, and  
11 said bracket tilts within said housing.  
12

13 23. A forensic light source as in Claim 21, wherein said output end of said flexible  
14 light guide tilts with respect to said filter wheel.  
15

16 24. A forensic light source as in Claim 17, wherein said a first mounting for  
17 supporting said filter at a selectable angular orientation of said filter relative to the  
18 path of propagation to vary said output wavelength characteristic, in response to  
19 said selectable angular orientation comprises a cam and cam follower, said cam  
20 follower being secured to said first mounting and said cam being secured to a cam  
21 support member mounted on said housing.  
22

23 25. A forensic light source as in Claim 17, wherein said light source is in a separate  
24 housing, said the separate housing being mounted on wheels and coupled to said  
25 filter by a flexible optical guide.  
26

27 26. A forensic light source as in Claim 17, wherein said mixing member generally  
28 rectangular in cross-section.

- 1 27. A forensic light source as in Claim 17, wherein said mixing member has a length  
2 to width ratio between 5 to 1 and 10 to 1.  
3
- 4 28. A forensic light source as in Claim 17, wherein said mixing member comprises a  
5 randomized fiber-optic bundle.  
6
- 7 29. A forensic light source as in Claim 17, wherein said mixing member comprises a  
8 compartment filled with a large number of light transparent members.  
9
- 10 30. A forensic light source as in Claim 17, wherein said filter for receiving light  
11 output by said output end of said flexible light guide is a selected one of a plurality  
12 of filters carried on a rotatable filter-supporting wheel, said filter supporting wheel  
13 being mounted on a post, said post being supported for tilting on a tilting support.  
14
- 15 31. A forensic light source as in Claim 17, further comprising:  
16 (f) a second filter for receiving light output by said output end of said flexible  
17 light guide along a path of propagation extending through said first filter and  
18 providing a twice-filtered light output, said twice-filtered light output having  
19 a twice-filtered output wavelength characteristic different from the  
20 wavelength characteristic of light output by said first filter, said twice-filtered  
21 output wavelength characteristic varying in response to the angular  
22 orientation of said second filter relative to said path of propagation; and  
23 (g) a second mounting for supporting said second filter at a selectable angular  
24 orientation of said second filter relative to said path of propagation to vary  
25 said twice-filtered output wavelength characteristic and pass said twice-  
26 filtered light output to said mixing member input face.  
27
- 28 32. A forensic light source as in Claim 31, wherein said first and second mountings

1 for supporting said first and second filters comprise first and second filter-  
2 supporting wheels, and further comprising a plurality of additional filters mounted  
3 on each of said filter-supporting wheels, said filter-supporting wheels being  
4 rotatably mounted on said housing.

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6 33. A forensic light source, as in Claim 17, wherein said mixing member is rigid.

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8 34. A forensic light source as in Claim 19, further comprising:

9 (f) a battery contained within said housing.

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11 35. A forensic light source as in Claim 33, further comprising:

12 (f) a battery pack contained located external to said housing; and

13 (g) a belt or strap secured to and supporting said battery pack.

14  
15 36. A forensic light source, comprising:

16 (a) a housing;

17 (b) a source of light, contained within said housing and outputting light at a  
18 plurality of wavelengths;

19 (c) a first filter for receiving light output by said output end of said flexible  
20 light guide along a path of propagation extending through said filter and  
21 providing a filtered light output, said filtered light output having an output  
22 wavelength characteristic different from the wavelength characteristic of light  
23 received by said filter;

24 (d) a first mounting for supporting said filter at a desired position on the path  
25 of propagation; and

26 (e) a rigid transparent member secured to said housing and positioned to  
27 receive the output of said filter, and said rigid transparent member defining  
28 multiple paths for light between a rigid transparent member input face and a

1 rigid transparent member output face.

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3 37. A forensic light source, comprising:

4 (a) a housing;

5 (b) a source of light, contained within said housing and outputting light at a  
6 plurality of wavelengths;

7 (c) a first filter for receiving light output by said output end of said flexible  
8 light guide along a path of propagation extending through said filter and  
9 providing a filtered light output, said filtered light output having an output  
10 wavelength characteristic different from the wavelength characteristic of light  
11 received by said filter, said output wavelength characteristic varying in  
12 response to the angular orientation of said filter relative to said path of  
13 propagation;

14 (d) a first mounting for supporting said filter at a selectable angular  
15 orientation of said filter relative to the path of propagation to vary said  
16 output wavelength characteristic, in response to said selectable angular  
17 orientation;

18 (e) a second filter for receiving light output by said output end of said flexible  
19 light guide along a path of propagation extending through said first filter and  
20 providing a twice-filtered light output, said twice-filtered light output having  
21 a twice-filtered output wavelength characteristic different from the  
22 wavelength characteristic of light output by said first filter, said twice-filtered  
23 output wavelength characteristic varying in response to the angular

24 orientation of said second filter relative to said path of propagation; and

25 (f) a second mounting for supporting said second filter at a selectable angular  
26 orientation of said second filter relative to said path of propagation to vary  
27 said twice-filtered output wavelength characteristic and pass said twice-  
28 filtered light output to said mixing member input face.



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2 38. A forensic light source as in Claim 37, wherein said first and second mountings  
3 for supporting said first and second filters comprise first and second filter-  
4 supporting wheels, and further comprising a plurality of additional filters mounted  
5 on each of said filter-supporting wheels, said filter-supporting wheels being  
6 rotatably mounted on said housing.

7

8 39. A forensic light source comprising:

9

(a) a housing;

10

(b) a light source contained within said housing, said light source having a  
11 light output;

12

(c) a power supply coupled to said light source;

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(d) a first tiltably mounted filter support member adjustably and movably  
14 mounted on said housing, said first filter support member comprising (i) a

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plurality of first filter receiving supports, and (ii) a plurality of first light

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filters each positioned in one of said first filter receiving supports, said first

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filter support member being adjustable to position any one of said first light

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filters to receive said light output and to filter said light output to produce a

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filtered light output and transmit said filtered light output; and

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(e) a second tiltably mounted filter support member adjustably and movably

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mounted on said housing, said second filter support member comprising (i) a

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plurality of second filter receiving supports, and (ii) a plurality of second light

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filters each positioned in one of said second filter receiving supports, said

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second filter support member being adjustable to position any one of said

25

second light filters to receive said filtered light output and to filter said

26

filtered light output to produce a twice filtered light output and transmit said

27

twice filtered light output.

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1 40. A light source as in claim 39 wherein said light source further comprises a  
2 handle secured to said housing, said handle being positioned and configured to be  
3 held by one hand and said the first and second filter support members being  
4 positioned to be adjusted by the thumb of said one hand.

5

6 41. A light source as in claim 39 further comprising a fan, and wherein said housing  
7 has at least one opening for air intake by said fan, and at least one opening for air  
8 exhaust by said fan.

9

10 42. A light source as in claim 39, further comprising focusing optics, said focusing  
11 optics dimensioned and configured to allow the user to focus light from said light  
12 source.

13

14 43. A light source as in claim 39, further comprising a reflective member, positioned  
15 to reflect light from said light source toward said focusing optics.

16

17 44. A light source as in claim 42, wherein said power supply is an external battery  
18 pack.

19

20 45. A light source as in claim 39, wherein said power supply is an external  
21 transformer and connection to a standard household power supply.

22

23 46. A light source as in claim 39, wherein at least one of said filter support members  
24 comprises a rotatably mounted light filtering wheel which defines a hole which does  
25 not contain a filter to allow light to be passed through said hole without being  
26 filtered.

27

28 47. A light source as in claim 39, further comprising a power control switch, said

1 power control switch having settings which turn the light and fan on  
2 simultaneously, turn the fan while keeping the light off, and keep the light and fan  
3 off.

4  
5 48. A light source as in claim 39 wherein said first and second filter support  
6 members are light wheels and said filters are bandpass filters, said filters being  
7 arranged such that their wavelengths, when arranged in a sequential order, are  
8 alternately placed on said first wheel and then said second wheel.

9  
10 49. A light source as in claim 48, wherein the selection of one filter on said first  
11 wheel and the selection of a second filter on said second wheel results in a bandpass  
12 narrower than the bandpass of said one filter or said second filter, the combined  
13 characteristic of said one filter and said second filter being formed by the  
14 juxtaposition of the characteristics of said one filter and said second filter and a  
15 bandpass wavelength range between said one and said second filters, and a  
16 narrower bandwidth than either said one or said second filters.

17  
18 50. A light source as in claim 49, further comprising a third filter wheel holding a  
19 plurality of additional filters.

20  
21 51. A light source as in claim 49, wherein in said third filter wheel mounts a plurality  
22 of band reject filters, said band reject filters selected to reject wavelengths which  
23 comprise certain commonly occurring exultation wavelengths which constitute  
24 noise and present the possibility of overpowering wavelengths which one wishes to  
25 detect or photograph.

26  
27 52. A forensic light source comprising:  
28 (a) a first housing;

1           (b) a second housing;  
2           (c) a light source contained within said first housing, said light source having  
3 a light output;  
4           (d) a first tiltably mounted filter support member adjustably and movably  
5 mounted on said second housing, said first filter support member comprising  
6 (i) a plurality of first filter receiving supports, and (ii) a plurality of first light  
7 filters each positioned in one of said first filter receiving supports, said first  
8 filter support member being adjustable to position any one of said first light  
9 filters to receive said light output and to filter said light output to produce a  
10 filtered light output and transmit said filtered light output; and  
11 (e) a second tiltably mounted filter support member adjustably and movably  
12 mounted on said housing, said second filter support member comprising (i) a  
13 plurality of second filter receiving supports, and (ii) a plurality of second light  
14 filters each positioned in one of said second filter receiving supports, said  
15 second filter support member being adjustable to position any one of said  
16 second light filters to receive said filtered light output and to filter said  
17 filtered light output to produce a twice filtered light output and transmit said  
18 twice filtered light output.